

DRAFT - ENHANCEMENT AREA ASSESSMENTS & STRATEGIES

Coastal Hazards: Assessment

Section 309 Programmatic Objectives

- I. Direct future public and private development and redevelopment away from hazardous areas, including the high hazard areas delineated as FEMA V-zones and areas vulnerable to inundation from sea and Great Lakes level rise.
- II. Preserve and restore the protective functions of natural shoreline features such as beaches, dunes, and wetlands.
- III. Prevent or minimize threats to existing populations and property from both episodic and chronic coastal hazards.

Coastal Hazards Characterization

1. Characterize the general level of risk in your state from the following coastal hazards :

Hazard	Current Risk	2000 Risk
Hurricanes/typhoons	High	High
Storm surge	High	High
Flooding	High	High
Shoreline erosion (episodic or chronic)	Medium	Medium
Sea level rise	Medium	Medium
Great Lakes level fluctuation	N/A	N/A
Subsidence	Medium	Medium
Geological hazards (including earthquakes and tsunamis)	Low	Low
Other: Shoreline Hardening	Medium	

2. If the level of risk or state of knowledge about any of these hazards has changed since the last assessment, please explain. Also, identify any ongoing or planned efforts to develop quantitative measures for this issue area.

When Hurricane Isabel made landfall in Virginia in 2003 it was only a Category 1 storm, but still managed to cause 36 deaths and \$625 million in damages to residential, commercial, industrial, and government structures. Tropical Depression Gaston (2004) and Tropical Storm Jeanne (2004) also caused major damage to property and roadways on Virginia's coast and were declared federal disasters. The destruction caused by these storms displays both the level of risk and the need for improved public awareness and education about damage prevention.

Although Sea Level Rise has not contributed to any documented risk in the past, there is a growing concern about its impact on shoreline management. Researchers at USGS have estimated relative sea level rise along the mid-Atlantic coast at 4 millimeters per year. However, wetland accretion rates are estimated at only 2 millimeters per year. The long-term result could be vast submergence of coastal wetlands. Coupled with both episodic and chronic shoreline erosion, this could become an even greater problem. While research is being conducted at the Virginia Institute for Marine Science (VIMS) on the potential impact of this combination, a management strategy has yet to be developed to address it.

Another concern related to sea level rise is risk associated with storm surge. A recent study by VIMS has shown that sea level rise accentuates the risk due to storm surge during hurricanes and other major coastal storms. The study concludes that storm flood risk assessments need to be able to be adjusted for most recent sea level trends.

There is a growing concern about the effect shoreline hardening to protect property from erosion will have on the natural shoreline. The VIMS *Virginia Wetlands Report*, Spring '05 issue, explains trends in shoreline hardening and the impacts of shoreline management in its Annual Summary article. Virginia issued permits to harden 229 miles of shoreline between 1993 and 2004 and that rate continues at 15 to 20 miles per year. These structures often have significant impacts to tidal wetlands, riparian areas, and fisheries habitat.

3. Summarize the risks from inappropriate development in the state, e.g., life and property at risk, publicly funded infrastructure at risk, resources at risk.

A consensus definition of or set of criteria for inappropriate development in Virginia's coastal zone has not been developed to date. However, coastal localities have different resources, geography, and population densities, so what constitutes inappropriate development in one place may not in another. For this reason, inappropriate development should be defined by each coastal locality in order to preserve the vital resources in their area. The following risks should be considered when identifying inappropriate development in Virginia's coastal zone:

- Damage or loss of habitat of migratory birds, particularly on the Eastern Shore, which has been documented as a critical migratory corridor for a wide variety of birds.
- Loss of cultural or natural heritage of highly undeveloped areas
- Destruction of vegetation on coastal primary sand dunes and beaches
- Increased erosion, flooding, property damage and loss of life during severe storm events
- Alteration of natural contours that act as buffers during storm events
- Decreased water quality from increased stormwater runoff, which also impairs habitat for marine animals and plants, such as oysters and SAV.

Management Characterization

1. Indicate significant changes to the State's hazards protection programs since the last assessment:

Mechanism	Changes 2000-2005	Changes 1997-2000
Building setbacks/restrictions	Moderate	None
Methodologies for determining setbacks	None	**
Repair/rebuilding restrictions	None	None
Restriction of hard shoreline protection structures	Moderate	Moderate
Promotion of alternative shoreline stabilization methodologies	Moderate	**
Renovation of shoreline protection structures	Moderate	None
Beach/dune protection	Significant	Moderate
Permit compliance	None	None
Inlet management plans	None	None
SAMPs	None	None
Local hazards mitigation planning	Moderate	None

Local post-disaster redevelopment plans	Moderate	**
Real estate sales disclosure requirements	None	**
Restrictions on publicly funded infrastructure	None	None
Public education and outreach	Moderate	Moderate
Mapping/GIS/tracking of hazard areas	Significant	**

** Mechanisms not included in the last Section 309 Assessment

2. For categories with changes:

- *Summarize the change*
- *Specify whether it was a 309 or other CZM driven change and specify funding source*
- *Characterize the effect of the changes in terms of both program outputs and outcomes*

Building Setbacks/Restrictions

The Virginia Uniform Statewide Building Code (USBC), updated in 2003, is based on the 2000 model building codes developed by the International Code Council, Inc. These new codes have more stringent fire and wind provisions.

Restriction of Hard Shoreline Structures, Promotion of Alternative Shoreline Stabilization Methodologies, Renovation of Shoreline Protection Structures

As a result of a grant from the Coastal Program, in May 2005, VIMS published the *Interagency Shoreline Management Consensus Document* providing guidance to various state agencies and local government for setting priorities for shoreline management in Virginia. The priorities, developed through collaboration with various state agencies, call for minimizing environmental impacts while providing erosion control. The four general approaches, from least to greatest impact, are 1) no action, 2) non-structural techniques, 3) combined non-structural and structural techniques, and 4) structural techniques. The document provides the best available technical advice on shoreline structures for property owners and provides specific case study examples illustrating how impacts to the environment can be minimized. Local and state governments are advised to identify areas that are ideal for no action to be taken. The priorities set in this consensus document will be reflected in the review of habitat management permits for development that affects tidal wetlands, coastal primary sand dunes, and subaqueous lands.

Beach/Dune Protection

The 2001 Coastal Needs Strategy focused on enhancing dune management and supported research to support amendments to the Coastal Primary Sand Dune Protection Act of 1980. The proposed changes are:

- Alternative jurisdictional definitions that would more accurately describe and delineate the functional limits of natural dune systems, as opposed to just primary coastal dunes.
- Expansion of the reach of the regulatory program to existing resources in current non-jurisdictional localities.
- Inclusion of beaches and their supporting dune systems.
- Changes to the definition of a resource protection features under the Chesapeake Bay Preservation Act and Regulations.

Several studies have been commissioned through Section 309 funds to support these goals. The VIMS studies, *Chesapeake Bay Dune Systems: Evolution & Status* and *Chesapeake Bay Dune Systems: Monitoring Years 1-4*, located, classified, and enumerated the existing jurisdictional dunes and dune fields of the Chesapeake Bay both inside and outside of the localities identified in the Dune Act. (The localities listed in the Dune Act are the counties of Accomack, Lancaster, Mathews, Northampton, and Northumberland, and the cities of Hampton, Norfolk, and Virginia Beach. Dunes within one of these localities are jurisdictional dunes.) The studies found 365 potential jurisdictional dune sites, of which 219 sites were determined to have primary sand dunes under the current definition. An additional 30 dune sites were counted in non-jurisdictional areas. The studies'

recommendations pertinent to Section 309 goals are that the state should: 1) amend the state definition of a dune to be more consistent with Virginia's coastal geology, 2) expand the jurisdiction of the Dune Act to include other localities with coastal dune fields, 3) establish Resource Protection Areas (RPAs) around beaches and dunes to eliminate overlapping regulatory authority, and 4) emphasize dune and beach restoration/creation to protect from shoreline erosion. As a part of the monitoring study, VIMS also analyzed created dunes as a component of shoreline management and found that there was significant value to creating secondary dunes and dune fields as a part of coastal hazard protection.

Local Hazards Mitigation Planning & Local Post-Disaster Redevelopment Plans

As part of the federal Disaster Mitigation Act of 2000, localities desiring federal dollars for hazards mitigation are required to develop local hazard mitigation plans. Beginning in 2003, the state asked the 23 planning district commissions (PDCs) in the state to manage the development of local hazard mitigation plans. The Federal Emergency Management Agency (FEMA) provides funding to the Virginia Department of Emergency Management (VDEM) which, in turn, provides funding to local PDCs. The federal approval process for these 23 plans is ongoing. Once a plan is approved federally, each locality in the district reviews the plan for approval. This plan development allows localities to determine risks, prioritize hazard mitigation efforts, and continue to receive federal funds. Furthermore, FEMA knows that localities are preparing for disasters and will at least be partially prepared for the redevelopment effort to follow.

Public Education and Outreach

Through a grant from the coastal program, VIMS reprinted the popular brochure, *Shoreline Erosion Problems? Think Green!* The brochure outlines alternative shoreline protection that does not require building hard structures.

The Virginia Department of Emergency Management (VDEM) staff distributes information and provides workshops and training sessions at local hardware and home building supply stores. Workshops about coastal hazards are focused on being proactive in preventing damage. Hurricane preparedness and basement flood-proofing are typical workshop topics. This outreach strategy allows homeowners and renters access to VDEM experts during their decision-making process.

Community education for coastal hazards in floodplain management encompasses many efforts. To minimize the potential for flood damage in coastal areas, the Department of Conservation and Recreation (DCR) responds to individuals requesting assistance and understanding of floodplain regulations. Since the last assessment, the number of requests for information has decreased. During the course of a year, DCR's Floodplain Management Program staff typically: responds to over 300 technical assistance requests; conducts and participates in at least 8 training sessions, workshops, and conferences on floodplain management; and conducts 60-80 community assistance visits. Requests for community education have remained in demand due to Hurricane Floyd in 1999, and Hurricane Isabel in 2003.

Permit reviews by Floodplain Management Program staff are largely the same as reported in the last assessment. The Floodplain Management Program reviews applications under the 401/404 joint permit application process, VDOT's State Environmental Review Process (SERP) and community development block grant programs. Reviews are conducted to ensure compliance with existing regulations and to ensure that modifications to structures and/or stream channels do not reduce the flow capacity of channels and lead to increased flooding. The Floodplain Management staff conducts over 250 reviews annually. In addition, in response to extensive levels of flooding in recent years, DCR's floodplain staff worked intensively with FEMA and other federal and state agencies to support response and recovery efforts. This work included community education efforts in several of Virginia's Tidewater communities that received Presidential disaster declarations.

Mapping/GIS/tracking of Hazard Areas

Since the last assessment FEMA has instituted a mapping conversion effort (map modernization) to convert older flood maps into a newer GIS- based format. In limited cases, additional detailed flood study work is

being done by DCR to update the older flood maps. Funding to update the maps comes through FEMA. At this time, access to digital maps is limited to localities that can technically support the GIS format.

The most immediate result of the change is an enhanced GIS-based digital version of the flood maps that allows communities to better manage identified floodplains. While this digitized resource is beneficial, there is a continuing need to conduct detailed flood studies. This is particularly relevant in rural communities where increased development pressures are occurring in areas where base flood elevations have been determined by an approximation method rather than by actual field survey.

3. Discuss significant impediments to meeting the 309 programmatic objectives (e.g., lack of data, lack of technology, lack of funding, legally indefensible, inadequate policies, etc.)

Until the proposed changes to the Coastal Primary Sand Dune Act are implemented, there will continue to be a gap in the state's ability to manage valuable dune and beach resources in localities not currently covered by the Act. These features serve to protect against coastal hazards such as shoreline erosion and flooding.

Furthermore, without regulatory or policy changes, hard structures will continue to be used as the most popular shoreline erosion control mechanisms, despite their damage to natural habitat. Improved outreach to waterfront property owners, training for local wetlands boards, and regulatory incentives should also increase the use of more appropriate shoreline management measures.

The lack of accurate, current information on shoreline erosion remains another significant impediment to meeting 309 objectives. There is a need to better understand the degree to which this condition (i.e. shoreline erosion) persists and is problematic within the coastal zone. There are no regional studies that report shoreline erosion or accretion trends in Virginia after 1983. Related to shoreline erosion, there is also a lack of information on the effect of sea level rise on coastal development *and* marshes.

Another major impediment is the ability to acquire land for shoreline protection. Coastal land values continue to rise, making public acquisition of easements, purchase of development rights, or other acquisition increasingly difficult.

Conclusion

1. Identify priority needs or major gaps in addressing the programmatic objectives for this enhancement area that could be addressed through a 309 Strategy. (See *impediments above*)

To overcome the impediment noted above, one recommendation is to implement the proposed changes to the Coastal Primary Sand Dune and Beaches Act after the VIMS Non-jurisdictional Beach Assessment is completed.

One major gap is the lack of readily available public outreach information after a major storm. People need to know exactly where to seek assistance with debris removal, flooding information, or redevelopment. To address this gap, better communication is needed between federal, state, and local governments. One possibility could be funding for localities to create "twenty most-asked questions after a natural disaster" pamphlets. The pamphlets would provide information about the initial steps to take to remedy post-hazard issues as well as appropriate contact information for local, state and federal assistance. Related to this, small businesses are significantly threatened by coastal hazards. Guidance for coastal communities on post hazard/disaster economic assistance to small businesses to avoid major economic shutdowns and dislocations is another public outreach need.

Capturing the public’s attention is also an essential need in hazard mitigation. From education about the detrimental aspects of coastal development to retrofits of personal property, there needs to be a better coordination between state agencies to develop engaging public campaigns to inform the public. Specifically, the Coastal Program could be instrumental in ensuring coordination among agencies and public education about the recommendations contained in the *Interagency Shoreline Management Consensus Document*.

A gap that could be filled by the Coastal Program would be to fund regional studies on shoreline erosion and accretion trends, as well as the effect of sea level rise on coastal development *and* marshes. More specifically, the Shoreline Inventory should be updated, shoreline evolution studies conducted, and shoreline management techniques identified and assessed. Related to this is the need for detailed flood studies, particularly in rural communities where increased development pressures are occurring in areas where base flood elevations have been determined by an approximation method rather than by actual field survey.

Another recommended study would aim to present the argument for implementing “living shoreline” practices for minimizing shoreline damage. This study should aim to increase public understanding of the role of natural resources in mitigating coastal hazards, such as the role of wetlands in reducing storm surges, and should lead to specific policies that would support the use of natural resources to reduce coastal hazards. More specifically, this study would present the General Assembly with the need for broader enabling legislation for alternatives to shoreline hardening that help reduce coastal hazards.

Another gap that might be filled by the Coastal Program is in assisting localities in acquiring the technology needed for the new GIS-based flood maps so that they can use this resource to identify floodplains. The Coastal Program could also help localities to define and develop programs to prevent inappropriate development as it relates to their geography.

Lastly, for the priority of acquiring sensitive land for shoreline protection, the Coastal Program may wish to consider how it can best leverage funding to assist in public land acquisition as well as private land conservation efforts by organizations such as The Nature Conservancy.

2. What priority was this area previously and what priority is it now for developing a 309 strategy and designating 309 funding and why?

<u>1997 Assessment</u>	<u>2000 Assessment</u>	<u>This Assessment</u>
High ____	High <u>✓</u>	High <u>✓</u>
Medium <u>✓</u>	Medium ____	Medium ____
Low ____	Low ____	Low ____

The destruction caused to Virginia coastal communities by Hurricane Isabel in 2003 as well as the unimaginable tragedy of Hurricane Katrina has brought awareness of coastal hazards into the forefront of the minds of Virginians. The Coastal Policy Team recognizes the importance of following through on the proposed changes to the Coastal Primary Sand Dune Act that came out of the previous Section 309 Assessment as well as to perform storm surge modeling and implement changes to shoreline management practices to protect against the these storms.

Coastal Hazards: Strategy

STRATEGY #1: *Dune and Beach Management*

Summary

The importance of natural features like dunes and beaches for protecting life and property against the destructive forces of coastal storms was proven by Hurricane Isabel. These areas also offer important habitats and can help protect water quality. The various projects undertaken during the last 309 Strategy for Enhanced Dune Management resulted in a much more comprehensive understanding of these dune and beach resources in Virginia. Through the research and inventory work of this strategy, coastal primary sand dunes and secondary dune systems were documented. The Virginia Coastal Policy Team, however, decided to delay a proposal to expand the Dunes/Beaches Act to cover all coastal zone localities until an assessment of the extent of supratidal (above mean high water) beaches could be completed.

In order to better convey the importance of, and reasoning for, proposed changes to the Dunes/Beaches Act during the upcoming 309 Strategy a report on recommendations for improving management of Virginia's dune and beach resources would be developed. This report could be used to explain the proposed changes to the Act to legislators, members of the Virginia Marine Resources Commission and local governments that would be affected by the changes. The report would include a summary of findings from the various dune and beach studies already conducted, as well as an overview of the value of these resources and the potential effect on the localities that would be affected by changes in the legislation. In order to help explain the findings and recommendations of the report, presentations would be given to the VMRC, interested local governments and wetlands boards, and to the Virginia General Assembly.

The need to improve the Coastal Primary Sand Dunes / Beaches Guidelines has already been noted and this need would be heightened if revisions were made to the Dunes / Beaches Act. In order to address this need, the second component of this strategy is to update and improve these guidelines. The guidelines would then be reviewed for approval by the Virginia Marine Resources Commission. Training on the new guidelines, as well as dune / beach management in general, would be offered to wetland board members and staff as well as other interested local officials.

Enforceable Policies/Outcomes

- A report on improving management of Virginia's dune and beach resources, including proposed revisions to the Coastal Primary Sand Dunes and Beaches Act.
- Anticipated changes to the Coastal Primary Sand Dunes and Beaches Act by the Virginia General Assembly.
- Revisions to the Coastal Primary Sand Dunes / Beaches Guidelines.

Tasks	Time	Budget
Task 1: Develop a report on improving management of Virginia's dune and beach resources and make presentations to VMRC, localities and the General Assembly.	Year 1	\$50,000
Task 2: Revise and reprint the Coastal Primary Sand Dunes / Beaches Guidelines and offer training on the new guidelines and dune / beach management in general.	Year 2	\$50,000

Total		\$100,000
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Year 1	Year 2	Year 3	Year 4	Year 5	Total Request
\$50,000	\$50,000				\$100,000